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RECENTLY PUBLISHED RESEARCH OF THE LENNINGRAD INSTITUTE OF HIGH PRESSURES

"Aluminum Silicate-Catalyzed Dealkylation of Side Chains in Aromatic Hydrocarbons," B. L. Moldavskii, L. S. Bezdel, Leningrad Inst of High Pressure

"Zhur Obshch Khimii" Vol 16, 1946, pp 1633-42

The catalyst, gumbrin, a natural Georgian bleaching clay, finely ground, was activated by 20% HCl in the cold during a few days, washed, dried at 100°, pressed, and granulated to 2-3 mm. The reactions were carried out uniformly at 410°, 1.5 volumes hydrocarbon per 1 volume catalyst, for 1 hour, with 14 compounds: (I) EtPh; (II) PrPh; (III) p-Me-C₆H₄Pr; (IV) BuPh; (V) iso-BuPh; (VI) sec-BuPh; (VII) p-iso-PrC₆H₄Cl; (VIII) iso-PrPh; (IX) m-iso-Pr-C₆H₄Me; (X) p-iso-Pr-C₆H₄Me; (XI) o-iso-Pr-C₆H₄Me; (XII) tert-BuPh; (XIII) m-tert-Bu-C₆H₄Me; (XIV) p-tert-Bu-C₆H₄Me. In this order, the yields of C₆H₆ (PhCl in case VII), determined by fractionation of the product were: 0,0,0,0,3,3,6,20,0,0,0,67,0,0%; the yields of PhMe: 0,0,0,0,0,0,0,0,45,56,67,0,86,~100%. The content of unsaturated hydrocarbons in the outgoing gas was determined for II, IX, XI, XII: 98,98,93,92 vol - %; the content of Me₂C=CH₂, for XII, XIII, XIV: 70, 70, 77 vol - %. The ease of splitting off the alkyl group evidently increases with increasing polarization of the bond between the alkyl and the ring, as in the AlCl₃-catalyzed reaction. The mechanism of the silicate catalysis is interpreted in terms of a formation of a complex between the alkylbenzene and the negative charged O atoms of the catalyst, polarization of the alkyl-ring bond, exchange of alkyl against proton, and desorption of C₆H₆ from the catalyst. The carbonium ion splits off the surface of the catalyst as olefin, returning the proton to the catalyst.

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"Kinetics of the Synthesis of Ammonia Under High Pressure: I. The Temperature of Conditions in the Reaction Zone," A. A. Vvedenskiy, and N. V. Sidorov, Leningrad Inst of High Pressures

"Zhur Priklad Khimii" Vol 19, 1946, pp 1157-68

In conventional laboratory columns, operating on the countercurrent heat-exchange principle, under pressures p up to 800 kg/sq cm, the temperature distribution along the reaction zone is nonuniform; with a 5-ml catalyst column, 13 mm in diameter, 40-45 mm high, grain size 1.5-2 mm, the temperature rose sharply from 500 to 600-650° over an initial segment of the catalyst zone equal approximately to 10% of its length and then fell to 520-500°. Because of this temperature gradient, the usual apparatus is unsuitable for kinetic studies of the process. Full data available.

"Isomerization of Hydrocarbons: VIII. Isomerization of 1-Butene \leftrightarrow 2-Butene and Their Equilibrium Relations," V. Zharkova, B. Moldavskiy, Leningrad Inst of High Pressures

"Zhur Obshch Khimii" Vol 17, 1947, pp 1268-70

The isomerization of butenes over the following catalysts were studied: H_3PO_4 on pumice, silica gel, $Al_2(SO_4)_3$, and activated clay (gumbrin). Full experimental data given.

"Relation Between Catalytic Activity and Ion-Exchange Ability of Aluminosilicates," Yu. A. Piteyazh, Leningrad Inst of High Pressures

"Zhur Obshch Khimii" Vol 17, 1947, pp 199-207

A rough parallelism is found between the cation exchange capacity of six different sorts of natural clays and kaolins, as expressed by their total content e of the exchangeable cations $H^+ + Al^{+++}$ (in milliequiv/100 g), and their cracking catalytic activity a after acid activation and ignition at 500-260° even though the latter treatment results in a reduction of the original e . Treatments harmful to the catalytic activity also lower e ; thus a clay with an original $e = 24$, after normal activation had $e = 16$, $a = 33\%$ (yield of gasoline in catalytic cracking), and after treatment with two highly concentrated (38%) H_2SO_4 showed $e = 16$, $a = 27\%$. Full data given.

"Electric Conductivity of Petroleum and Petroleum Emulsions," V. P. Teodorovich, Leningrad Inst of High Pressures

"Energet Byul" No 8, 1947, pp 16-19

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The electric conductivity K of samples of three types of petroleum and of their emulsions with H_2O containing up to 50% H_2O was found to rise with the temperature, between 20° and 90°, the faster the higher the H_2O content. An emulsion with 50% H_2O had K about 2-3 times greater than the dry petroleum; temperature rise from 25° to 90° increased K 10-20 times. To obtain correct values, it is necessary to maintain the emulsion through stirring or flow; the K values measured under such conditions are lower than those calculated by the equation of Fricke (C.A. 19, 595). Microscopic examination of emulsions in an electric field of 1,000-2,000 v/cm showed alignment of water droplets in strings and merging of droplets into larger drops.

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